NEST-BUILDING FISH.—The habits of those few fishes which build nests for their progeny are very curious, and indicate a highly-developed instinct. One of these, the Gourami (*Asphronemus olfax*), has lately been studied by M. Carbonnier in his private aquarium. The male animal constructs a nest of froth of considerable size, 15 to 18 centimetres horizontal diameter and 10 to 12 centimetres height. He prepares the bubbles in the air (which he sucks in and then expels), strengthening them with mucous matter from his mouth, and brings them into the nest. Sometimes the buccal secretion will fail him, whereupon he goes to the bottom in search of some confervæ, which he sucks and bites for a little, in order to stimulate the act of secretion. The nest got ready, the female is induced to enter. Not less curious is the way in which the male brings the eggs from the bottom into the nest. He seems unable to bring them up in his mouth; instead of this, he first takes in an abundant supply of air, then descending, he places himself under the eggs, and all at once, by a violent contraction of the muscles in the interior of the mouth and pharynx, he forces out the air he had accumulated, by his gills. This air, finely divided or pulverised, in some sort, by the lamellæ and fringes of the gills, escapes in the form of two jets of veritable gaseous powder, which envelops the eggs and raises them to the surface. In this manœuvre, M. Carbonnier says, the Gourami quite disappeared in a kind of air-mist, and when this had dissipated, he reappeared with a multitude of air-bubbles like little pearls, clinging all over his body.

BEAVER IN SIBERIA.—The beaver which, some centuries ago, was so numerous in Russia and Western Siberia, and which was supposed to have totally disappeared from both countries, continues to exist on the rivulet Pelyin. M. Poliakoff has procured from an ostyack on the Obi five skins of these animals killed last year, and he has engaged a hunter to procure this winter complete specimens for the Museum of the St. Petersburg Academy. No farther back than a century ago the beaver was common on one of the affluents of the Irtysh, Bobrofka, but it has now totally disappeared from the locality, the last colony existing probably on the Pelyin.

NOTES

THE first volume of "China," by the well-known geologist Baron von Richthofen, has just appeared. The Berlin Academy of Sciences has granted a generous sum to defray the expense of publishing this costly work.

WE have pleasure in announcing that a new Natural History Journal is about to be started, which is intended to form a bond of union among the various schools belonging to the Society of Friends in this country, both those for boys and girls. Some of the oldest societies of the kind in the country are in connection with these schools, especially the one at York, to which reference has more than once been made in these columns. The journal is intended to be specially devoted to young beginners; the main object being to awaken a personal interest in natural history pursuits, and to induce tyros to make and *record* observations. By this means it is hoped to promote a genuine study in place of the indiscriminate collecting now so much in vogue. Other cognate subjects will also be taken up as space permits, such as chemistry, carpentry, &c. It is intended to publish the first number on February 15; communications, which are warmly invited, should be addressed to J. E. Clark, B.Sc., 20, Bootham, York.

UNDER the title of the "Indian Miscellany," a work is announced by Mr. J. Munsell, of Albany, New York, on the history, arts, inventions, languages, religions, traditions, and superstitions of the American aborigines; with descriptions of their domestic life, manners, customs, traits, governments, wars, treaties, amusements, exploits, &c.; together with sketches of travel and exploration in the Indian country, incidents of border warfare, journals of military expeditions, narratives of captivity, anecdotes of pioneer adventure, missionary relations, &c.

M. ED. BECQUEREL has been elected president of the French Physical Society, which seems, like its English sister society, to be doing excellent work.

THE Council of the Geographical Society of Paris has appointed M. Levasseur president for 1877. MM. Daubrée and Quatrefages have been appointed vice-presidents, and M. Maunoir has been continued general secretary.

IT is stated on good authority that the measurement of the photographs taken by the French parties during the transit of Venus is not progressing favourably. More than 1,000 plates are to be investigated micrographically, and at the present moment only forty-seven have been disposed of. Unforeseen difficulties are said to have arisen.

IN 1828 M. Janson de Sailly, a French barrister who had married a sister of the celebrated Berryer, left by will his fortune to the French University, under the condition of creating a high school in the Quartier des Champs Elysées, to be named Janson College. The will was accepted by the Government, but the heirs tried to get it cancelled, and a law-suit was instituted, which was ended only in December, 1876. The Janson College will be inaugurated in 1878. The legacy is quite adequate to carry out the purpose of the testator, who was proprietor of the greatest part of a large estate.

GERMAN educational statistics show that in Saxony one out of 1,194 of the total male population is in actual attendance upon a university, while in Prussia the proportion is 1 io 1,328.

THE next annual meeting of the *Deutsche geologische Gesellschaft* takes place at Vienna, in September of this year.

THE Council of the Society of Arts have made arrangements for the delivery of six lectures on various scientific subjects, which will take the place of the usual papers and discussions, on six Wednesday evenings during the session. The following gentlemen have each consented to deliver one of the lectures:—Sir John Lubbock, Bart., F.R.S., Mr. E. J. Reed, C.B., M.P., Prof. W. K. Clifford, M.A., F.R.S., Prof. Alexander Kennedy, C.E., Dr. B. W. Richardson, F.R.S., Mr. James Baillie Hamilton.

THE Bremen Geographical Society has received a report from Capt. Wiggins dated Jenissei, November 25, in which he gives more fully the results of his late voyage to Siberia. The Podaratta Bay was found to be exceedingly shallow, and the river itself could not be ascended by craft drawing over two feet of water. Special stress is laid upon the discovery of the channel for sea-going vessels up the picturesque Jenissei as far as Kureika. Numerous observations of the temperature of the air and water, the specific gravity of the latter, &c., were taken during the progress of the voyage. These all tend to show that the Gulf Stream and equatorial currents exert a decided influence much farther to the east than was hitherto supposed, as they pass through the straits of Jugor and Waigat into the Karian Sea.

THE adherence of air round a current of some fluid or liquid when this is forced through the air, has been utilised in various ways, as in water bellows, the blast pipe of locomotives, Sprengel's air-pump, the Bunsen burner, &c. Prof. Teclu, of Vienna, has recently described, in *Poggendorff's Annalen*, a simple arrangement, in which a jet of steam is used to do the work of an air-pump. A small steam boiler containing 1·5 litres of water, and tested to something over one atmosphere, is heated over a gas furnace. It has a safety-valve, which also serves for admission of water when necessary. From above rises a brass steam pipe consisting of two similar parts, each of which is a tube narrowing upwards; the terminal aperture of the lower tube (*a*) is situated just where the contraction of the upper tube (*b*) terminates, leaving a small annular aperture. Two lateral tubes proceed from the wide portion of the upper tube, one to the vessel to be exhausted, the other to a manometer. It will be seen that the steam issuing from the boiler exerts suction on the air in the connected vessels.

At a meeting of the Edinburgh Botanical Society, held on January 11, Mr. M'Nab made a second communication on the scarcity of holly berries at Christmas. He has learned from correspondents in various parts of the kingdom that the scarcity of holly berries has been very general. The only places where the supply of berries has been abundant are in the Highlands, in such districts as the Trossachs, and in the vicinity of Loch Katrine and Loch Ard. At Ranelagh, near Dublin, few berries were to be obtained, but several of the trees were covered with clusters of white and cream-coloured flowers, and it is of interest to note that all the flowers, both open and past, of the specimens received by Mr. M'Nab from Ranelagh, were hermaphrodite.

At a meeting of the Glasgow Philosophical Society, held on Wednesday, January 10, it was agreed, on the motion of Sir William Thomson, to petition both houses of Parliament for the amendment of the Patent Laws, the objects aimed at being the reduction of the stamp duty on patents, an extension of the time for which patents were granted, and the abolition in connection with the notice to proceed.

At the second meeting of the Edinburgh Naturalists' Field Club, which was held on Friday last, a lecture on "Foraminifera," copiously illustrated by diagrams and microscopical preparations, was delivered by Mr. D'Arcy W. Thompson, a pupil of the present seventh class of the Edinburgh Academy. Science lectures *by* schoolboys are a much rarer occurrence than science lectures *to* them.

In a note to the Roman Academy on the rate of oratorial utterance, M. Mariotti recalls an observation made by Gibbon that a facile English orator pronounced 7,200 words in an hour, *i.e.*, 120 in a minute, and two in a second. Though it might seem possible to investigate the velocity of the Greek and Roman orators, knowing that the judicial orations in Athens were recited in a space of time determined by the clepsydra, yet their methods render conjecture somewhat vague. Thus, *e.g.*, it is said that Caius Gracchus, when speaking in the forum, had a servant concealed behind him, who, with an ivory instrument, signalled to him at the proper moments to raise or to lower his voice. Nowadays, when parliamentary discussions, as has been said, are little more than animated conversations, accurate observations may be made by means of stenography on the rate of speaking of various orators. M. Mariotti gives some such data from the Sub-Alpine and Italian Parliaments. De Foresta pronounced sixty words in a minute; Massimo d'Azaglio, 90; Gioberti, 100; Ratazzi, 150; Mameli, 180; Cordova, the quickest, was able to pronounce as many as 210. The very rapid orators, M. Mariotti says, are rather admired than effective, such as Macaulay in England, and Cordova in Italy. The mind of the hearer is not allowed sufficient time to take in the meaning. It is possible, speaking rapidly in the Italian tongue, to pronounce 300 words in a minute. Comparative observations on the subject in parliaments of different countries, would afford important data regarding various tongues, and suggest interesting psychological considerations. From observations in the Parliament of Athens, it might be possible to conjecture the velocity of the ancient Greek orators. In this way stenography might render valuable services to philology and philosophy.

We notice in the January number of the *Geological Magazine* a paper by Mr. James Durham on "The 'Kames' in the Neighbourhood of Newport, Fife, N.B.," accompanied by a sketch-map of the locality. Unhappily, the paper is written much in the same style as too many papers on kames have already been written, and we find in it, as is too often the case, more generalisations than thorough descriptions of the interior structure of these interesting formations, and not even a single detailed section. It gives us an opportunity, however, of observing that only thorough explorations of the structure of those kames the interior of which is rendered accessible by adequate cuttings, together with detailed studies of the directions, positions, and forms of the kames, discussed in connection with the topography of the locality and its neighbourhood, can help us to settle the question as to the origin of kames, so much debated hitherto without arriving at any definitive result. As to the conclusions of the author, viz., that "the kames" owe their present forms to the same denuding agencies as are at present in operation, we must object that, even if the author had proved his statement with reference to the Newport kames, he was by no means entitled to generalise from it; there are hundreds of kames and thousands of totally identical gravelly mounds and ridges the shapes of which have nothing to do with denuding agencies.

The first number of the *Veröffentlichungen des kaiserlichen deutschen Gesundheitsamtes*, appeared last week. It gives the mortality statistics of about 150 German cities and a large number of foreign cities, and supplies a most valuable picture of the progress of epidemics as well as the general statistics of disease, and the working of all sanitary regulations at home and abroad. A graphic representation of the meteorology of the past week is also added.

Very high floods, second only to those of 1872, are reported, by Russian newspapers, from the shores of the Amoor. After unusually heavy rains, which fell almost without interruption from the middle of July until the end of August, the waters of the great river rose so as to menace even Blagovieshensk, built on a comparatively high bank, and overflowed the villages and fields of the Upper and Middle Amoor. A very heavy gale visited also the Lower Amoor on the night of September 18 and 19. Some barges were destroyed, a steamer was much damaged, and some houses on the shore at Kharabofka were washed away.

The rain which fell at St. Jaen, in the Côtes-du-Nord, on the night of December 29-30, 1876, was observed to be tinged red. A bottle filled with the water has been sent to Dinant to be analysed microscopically and chemically.

The French Government is selling by auction the last four balloons which were constructed during the siege for escaping from Paris. These balloons are considered unfit for service, and others will be constructed by the balloon committee, a credit of 200,000 francs having been placed in the budget of 1877 for military ballooning.

News has been received from the *Frigorific*, which has arrived with its cargo of meat at La Plata, where experiments have been continued on the largest scale. The success is complete.

The Paris-Lyons-Mediterranean Railway Company have ordered sixty locomotives to be constructed, which are intended to travel from Paris to Marseilles (1,820 kilometres) in twelve hours. The Northern Railway has established comparative experiments on the Westinghouse continuous brakes and electric brakes. The old hand-brakes are to be superseded at any cost by the Northern Railway.

Prof. Mach, of the Vienna Academy, has recently made some experiments on the velocity of propagation of sound-waves from explosion. He finds that in course of the motion this velocity diminishes, and soon approximates to the ordinary velocity of sound. In one experiment, by means of a fall-apparatus with double hammers, two percussion caps were exploded (at a determinate interval) at the two ends of a tube. From the displacement of the interference-band on the inner smoked surface of the tube, the velocities were found to be more than 700 metres over a stretch of 50 centimetres. With weaker explosions or longer stretches, the velocities were less. Again, a pistol-ball, whose velocity was determined, liberated at two stations, at a measurable interval of time, two electric discharges. From the displacement of the interference-band, the velocity appeared to be about 400 metres. Several other experiments are described in Prof. Mach's paper.

MR. FREDERICK A. OBER has recently sailed from America for Martinique to commence an exploration of the West India Islands, under the patronage of the Smithsonian Institution. Mr. Ober proposes to begin at Martinique, and to collect the vertebrates on all the Leeward Islands, visiting each one in succession, and proceeding east and south by the Windward Islands to the Spanish Main. The work will probably occupy several years, and with it will be combined the taking of photographic views of the scenery and inhabitants. It is believed that, should Mr. Ober be as successful as he anticipates, a critical investigation of his collections by specialists will not only bring to light species long ago described and not met with for many years, but will include some new to science, and at the same time elucidate many interesting problems in physical and zoological geography.

MR. JOHN MURRAY has the following new works in the press:—"Scepticism in Geology, and the Reasons for it," by Verifier; "The Cradle of the Blue Nile," an account of a journey through the mountains of Abyssinia and the plains of Soudan, and a residence at the court of King John of Ethiopia, by E. A. De Cosson, F.R.G.S.; "Pioneering in South Brazil," a narrative of three years of forest and prairie life in Paranâ, by Th. P. Bigg Wither. These two last books will both be accompanied by maps and illustrations.

WE have the following books on our table:—"Winds of Doctrine," by Ch. Elam (Smith, Elder, and Co.); "Thebes and its Five Greater Temples," by Capt. Abney, F.R.S. (Sampson Low and Co.); "Animal Physiology," by Prof. McKendrick (Chambers); "The Two Americas," by Sir R. Lambart Price (Sampson Low and Co.); "The Discoveries of Prince Henry the Navigator," by R. H. Major (Sampson Low and Co.); "Darwiniana," by Prof. Asa Gray (Trübner); "Across the Vatna Jokull," by W. L. Watts (Longmans); Dr. Dobell's "Reports on Diseases of the Chest," vol. ii., 1876 (Smith, Elder, and Co.).

THE additions to the Zoological Society's Gardens during the past week include two Secretary Vultures (*Serpentarius reptilivorus*) from South Africa, presented by Capt. Larmer, of s.s. *African*; two Crowned Partridges (*Rollulus cristatus*) from Malacca, presented by Mr. Barclay Field; three Chukar Partridges (*Caccabis chukar*) from North-West India, presented by Capt. Newton Pauli; two Caroline Conures (*Conurus carolinensis*) from North America, presented by Mr. L. Delves Broughton; a Wood Owl (*Syrnium aluco*), European, presented by Mrs. A. O. Faulkner.

SCIENTIFIC SERIALS

THE *American Journal of Science and Arts*, December, 1876.—Experiments on the nature of the force involved in Crookes's radiometer, by O. N. Rood.—Experiments on the sympathetic resonance of tuning-forks, by Robert Spice.—Types of orographic structure, by J. W. Powell.—On the ethers of uric acid, by H. B. Hill.—Notice of a meteorite from Madison Co., N.C., by B. S. Burton.—On a recent discovery of carboniferous Batrachians in Nova Scotia, by J. W. Dawson.—On the association of crystals of quartz and calcite in parallel position, as observed on a specimen from the Yellowstone Park, by Edward S. Dana.—Principal characters of the American Pterodactyls, by O. C. Marsh.

SOCIETIES AND ACADEMIES

LONDON

Mathematical Society, January 11.—Mr. S. Roberts, treasurer, in the chair.—Mr. G. W. von Tunzelmann was elected a member.—The following communications were made to the Society:—Determinant conditions for curves, or surfaces, of the same order, having all their intersections common, by Mr. J. Hammond.—Numerical values of the first twelve powers of π, of their reciprocals, and of certain other related quantities, by Mr. J. W. L. Glaisher, F.R.S.—On some general classes of multiple definite integrals, by Mr. E. B. Elliott.—On the partial differential $s + Pp + Qq + Z = 0$, by Prof. H. W. Lloyd Tanner.—Determination of the axes of a conic in tri-linear co-ordinates, by Mr. J. J. Walker.—On some elliptic-function properties, by Prof. H. J. S. Smith, F.R.S.

Linnean Society, December 21, 1876.—Prof. Allman, president, in the chair.—Mr. Thomas Christy and Mr. Robert Drane were balloted for and duly elected Fellows of the Society.—The butterflies of Malacca, formed the subject of a paper by Mr. A. G. Butler. Of 258 species now registered from Malacca thirty-six are endemic; of the remainder sixty-five also belong to Assam or Nepal, thirty-eight to Moulmein, thirty-three to Ceylon, ninety-four to Penang, forty-six to Singapore, 112 to Borneo, forty-one to Sumatra, eighty-seven to Java, thirty-nine to Siam, twenty-six to China, two to New Hebrides, and six to Australia. Thus the Malaccan butterflies preponderate towards those of the Indian region. For several reasons, however, the so-called Penang fauna must be accepted with considerable qualifications.—A communication was read from Mr. J. R. Jackson on the commercial uses of a species of cane termed "Whangee." This was shown to be a species of *Phyllostachys*, possibly *P. nigra*, and supposed to be from China. That common in the trade he considers not to be the stem proper but the rhizome; pale-coloured, as introduced, plants of the kind in question grown in England produce a black cane, hence bleaching must be resorted to with the commercial sort.—*Craniorrhinus waldeni* is the name of a new Hornbill from the Island of Panay (Philippines), described by Mr. R. B. Sharpe. It is allied to *C. cassidix*. The new species was found by Prof. Steere in a virgin forest in the mountainous range of the island.—An extract of a letter from Dr. J. Anderson, of Calcutta, was read. It mentioned some curious facts in connection with the Hornbills *Hydrocissa albirostris* and *Aceros subruficollis*. These birds greedily devour, head foremost, the smaller kinds of the feathered tribe, and before doing so break all the bones of the bodies and toss the bird about.—The Secretary read some morphological notes on certain species of *Thunbergia*, by Mr. Marcus Hartog. He states that microscopical sections of *T. laurifolia* reveal axillary buds inside the sixth and eighth pair of bracts, the basal elevations becoming pedicel and bractlets, and inside these, by repetition, sister buds arise. The flowers are thus axillary buds formed in succession from the axis outwards and are as independent as if they had arisen side by side.—Dr. Buchanan White brought forward a paper on the male genital armature in the European Rhopalocera. His researches yield evidence that as in some other orders of the Insecta the appreciable structural variations of the organs in question afford good characters whereby to distinguish not only genera, but species, of the above limited group of Lepidoptera.—Prof. Flower communicated a memoir on the morphology of mammalian *Ossicula auditus*, by Mr. A. G. H. Doran. While dealing with these diminutive bones *in extenso*, the author more particularly confined his summary to those of the Insectivora, Cheiroptera, Cetacea, Sirenia, Edentata, Marsupialia, and Monotremata. In the first of these groups the ossicula present no positive or marked characteristic. Among the bats there is a resemblance to what obtains in the shrews, except in the genus *Pteropus*, where the malleus is of a lower type. Of whales, *Balæna* has the most generalised type; the dolphins have relatively stout stapedial crura and other marked features; *Platanista* has slightly modified ossicula. Those of Sirenia are distinguished by weight and outline. Certain of the Edentata (armadillos) differ among themselves, and so do the sloths and ant-eaters, as far as concerns their internal ear-bones. Marsupials possess ossicula of a low grade still descending in the Monotremata. The general conclusion arrived at is that even by the so-to-say subsidiary differentiation of the auditory ossicles doubtful affinities in some cases receive a certain interpretation.—*Actæmorpha erosa* is the name given to a new genus and spe-